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MINNESOTA DEPARTMENT OF
LABOR & INDUSTRY

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March 3, 2009

The Honorable Kathleen Sheehy
Office of Administrative Hearings
P.O. Box 64620
St. Paul, Minnesota 55164-6260

Re: In the Matter of the Proposed Rules of the Minnesota Board of High Pressure Piping Systems Relating to High Pressure Piping, Minn. Rules Chapter 5230; OAH Docket No. 3-1900-20064-1; Governor's Tracking No. AR454

Dear Judge Sheehy:

I have been asked by the Board of High Pressure Piping Systems chairman, Larry Stevens, Jr., to describe the high pressure piping inspection unit's practical interpretation of "repairs on an existing installation." I will also describe the skills needed for welding high pressure piping (HPP) replacements versus installing manufactured threaded or flanged replacements, and the need for inspection of the welded piping joints.

As I stated at the hearing, I have been employed by the Department of Labor and Industry since November 1997. As a new inspector, I spent the first weeks completing inspections with other inspectors who had been with the Department for several years. This allowed me to learn the ropes as an HPP inspector, and to learn how the other inspectors interpreted several terms not defined in the Minnesota statutes or rules.

One of the first interpretations explained to me was "repairs on an existing installation." I was told that the Department inspectors have always interpreted this to mean no cutting, threading, or welding of pipe. Work that could be performed as a repair included the replacement of "like for like" manufactured valves, strainers, steam traps, threaded fittings and manufactured pipe nipples, and appurtenances that would not require any additional pipe or rerouting of HPP systems. This allowed owners of these piping systems to use unlicensed persons to perform day-to-day maintenance on items that wear out most often, yet require little pipefitting knowledge or experience. This repair work merely involved loosening bolts on flanges or threaded components, installing an identical item, and tightening the bolts or replacement fitting.

As a pipefitter and welder for 17 years before becoming an HPP inspector, I understood the reasoning behind this interpretation. Becoming a licensed HPP pipefitter requires four years of training and hands-on experience. This allows the supervised pipefitter apprentice or unlicensed individual time to learn all the various types of piping systems, the different piping joints used in each, and how to properly measure, cut, bevel, flare, or cut threads on the ends of pipe to the

proper depth, assuring a tight pipe joint. This also would give apprentices or unlicensed individuals time in the practice booth, learning how to properly perform welding for those who wish to become welders.

I have attached photos of typical steam piping installations.

Attachment A: This photo was taken at a honey drying facility in northern Minnesota. Under the current Department interpretation and the Board's proposed definition of repair, unlicensed individuals could replace every valve, fitting, steam trap, strainer, flex joint, and manufactured threaded pipe nipple that I have circled in red. As you will see, this does not limit unlicensed workers to fixing a "bathroom sink dripping" as an Xcel Energy employee stated.

Attachment B: In this photo of steam system piping, the three larger flanged valves and the gaskets for each flange, as well as the two smaller threaded valves could all be changed out as a repair item under the Board's proposed definition. The welded joints on the tees, 90 degree elbows, flanges and reducers would all require an HPP license and permit to replace.

Today, there are 982 locations in Minnesota with piping systems that fall under the HPP code. These include dry cleaners, hospitals, food processing plants, paper mills, ethanol plants, electric utilities, bioresearch facilities, municipal heating plants, the University of Minnesota and many state colleges. If the Department were to allow replacement of all parts on HPP systems as a "repair," there would be no inspection of piping system replacements, including welded piping joints. The fact that Xcel Energy employees commented at the hearing that they have a welding apprenticeship program does not eliminate the need for trained, licensed pipefitters to make replacements to these facilities.

HPP inspectors must also be qualified. Every HPP inspector hired by the Department is required to acquire a Certified Welding Inspector certification by the American Welding Society (AWS). This is the most recognized welding inspector certification in the nation, and not only trains inspectors how to visually inspect welded pipe joints for code compliance, but also certifies them to review and approve welding procedure specifications, procedure qualification records, and welder performance qualifications to any code standard, including the American Society of Mechanical Engineers code standards. According to AWS AC1:2007 Standard for AWS Certification of Welding Inspectors, AWS Certified Welding Inspectors are certified to "verify that the work inspected and records maintained, conform to the requirements of the applicable standards."

Inspections by the Department's HPP inspectors are triggered by permit applications. If a licensed contractor does not file an application for a permit, then the Department may never know that HPP work has occurred (unless a complaint is received or an ammonia release or other incident is reported). The Department does not require permits for work that falls within the definition of "repairs on existing installations." Therefore, the Department never inspects that work and usually would not know about it.

The Department's inspectors have found many non-code conforming welds prepared by unlicensed persons. I have attached a few photos of HPP welds prepared by unlicensed people.

Attachment C: This is a printed page found on the Department's website. The narrative on the page explains the numerous faults found with the welds and pipe supports. What the webpage does not detail is the potential hazards if these welds had been allowed to be put in to service. A weld failure and major ammonia refrigerant release would have been very likely, given the complete lack of code compliant welding and support of the piping system. If not for the permit obtained by a licensed contractor working at this facility, Department inspectors may not have been on site and found these welds. Refrigerant ammonia is extremely volatile if not contained. It can cause chemical burns and suffocation, and is explosive at the right concentration with air. In August 2007, an ammonia refrigerant release on a piping system at a Waterloo, Iowa beef processing facility sent seven plant workers to the hospital with skin and inhalation burns. One of those workers died from injuries suffered from the release. There are currently 149 locations in Minnesota that have ammonia refrigeration systems. The HPP license and permit requirements, along with Department inspections of these installations, help to ensure the safety of workers and the public.

Another example is Exhibit 98, which I described at the rules hearing. This welded joint was installed by an unlicensed person at a food processing facility on the main steam supply line from the boiler. A Department inspector found this, along with other serious code violations before the pipe was placed in service. Because the untrained, unlicensed person welded together two incompatible metals, the introduction of steam pressure could have caused the pipe and fitting to fly apart. Anyone standing near this pipe when steam pressure was to be introduced could have been severely injured by the flying pipe and fitting, as well as by the 125 psi, 354 degree Fahrenheit steam in the system. This welded joint was less than two days from being placed into service when the Department inspector discovered it.

Whenever Department inspectors discover that HPP has been installed by an unlicensed contractor or owner employees, the Department requires this piping to be removed. Before being placed into service, the HPP must be re-installed by licensed HPP pipefitters, employed by a licensed HPP business, with the appropriate permit to construct/install HPP.

Allowing owners of HPP systems to use anyone of their choosing to cut, thread, or weld replacements on these industrial piping systems without licenses and permits would severely lessen the possibility of Department inspection and code compliance verification. I do not believe it is in the best interest of public safety to allow unlicensed, uninspected HPP welding at 982 different locations.

Thankfully, most owners of HPP systems are aware of the Department's enforcement of "repairs." In fact, several owners employ licensed pipefitters and obtain annual "blanket" permits to install piping. These "blanket" permits are allowed under Minnesota Rule 5230.0100, subpart 5(C) (2007). Such "blanket" permits allow the installation of piping for maintenance as needed on an ongoing basis, without any delay. Owners of HPP systems with such blanket permits include Minnesota Power, American Crystal Sugar, Boise Paper, and the University of Minnesota.

Xcel Energy and Flint Hills Resources each have an HPP business license and employ one or more licensed pipefitters. I checked the permitting records and found that Xcel Energy has applied for only 11 permits to install since 2002, and one of these was for the City of Minneapolis. None of these permits were blanket permits. Flint Hills Resources has applied for only two permits since 2002. One permit was for fabricating new piping. The other permit was a blanket permit for 2003, but Flint Hills never reported any projects completed under this permit.

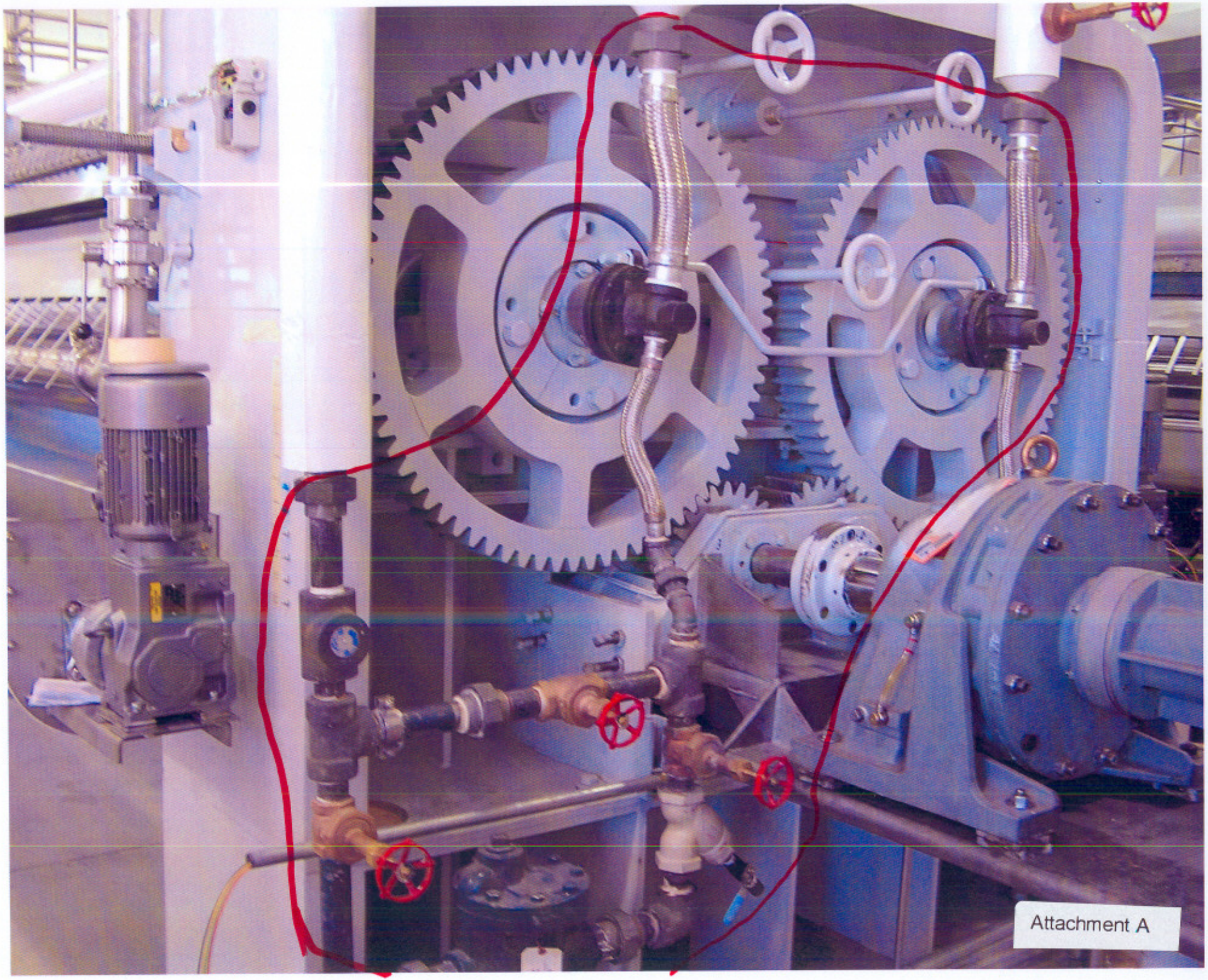
I am familiar with the examination administered by the Department to applicants for journeyman high pressure pipefitter licenses. Approximately two-thirds of the examination is on welding, pipefitting, and power piping (steam) systems, and approximately one-third of the exam is on ammonia refrigeration piping.

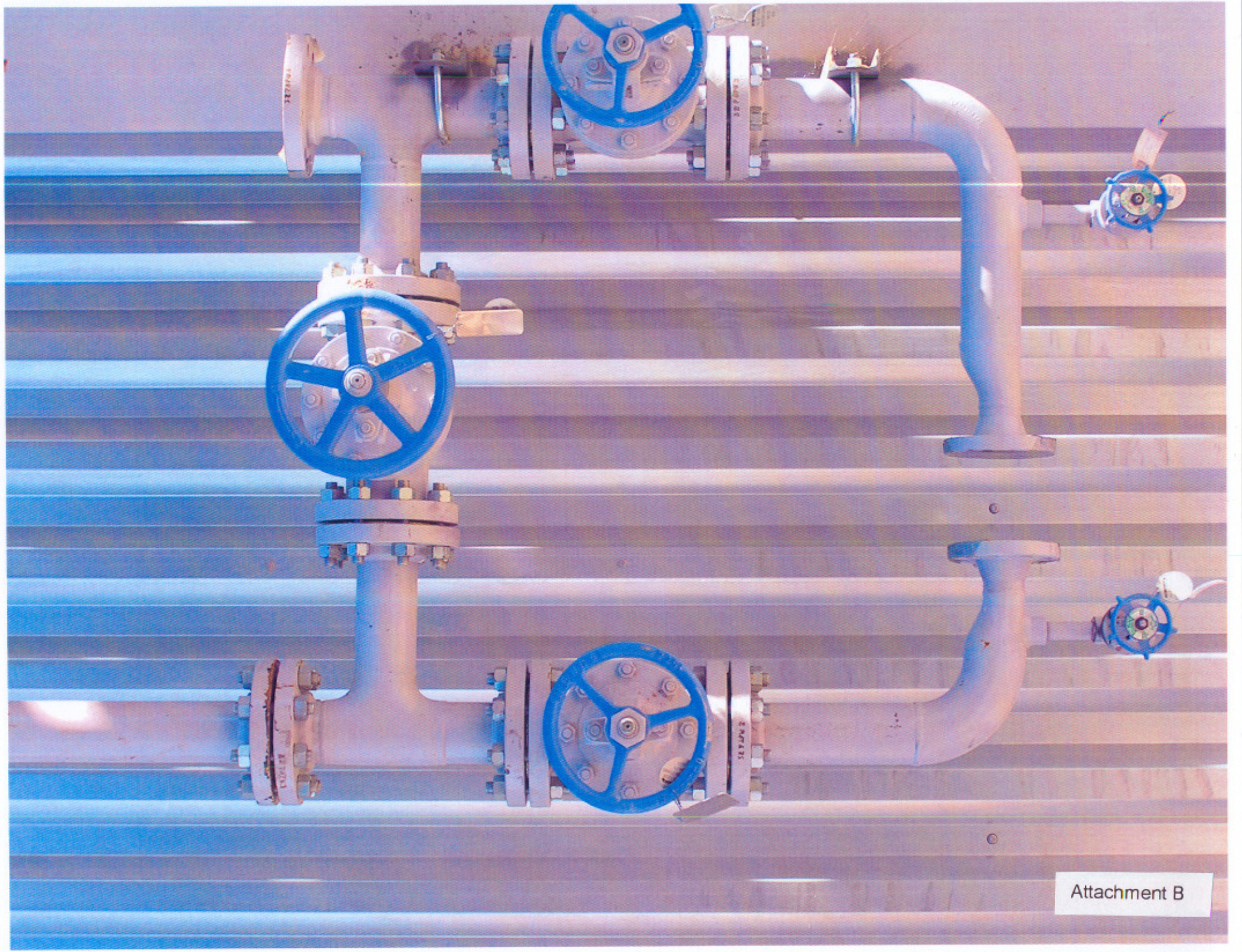
In closing, since I have been employed by this Department, the HPP inspection unit has never allowed owners of HPP systems to use unlicensed personnel to replace non-manufactured HPP components regardless of the type of piping joint. This work has always required licenses and permits.

Sincerely,

Todd A. Green

Todd Green
Chief High Pressure Piping Inspector
Minnesota Department of Labor and Industry
651-284-5124


Attachment A


Attachment B

MINNESOTA DEPARTMENT OF
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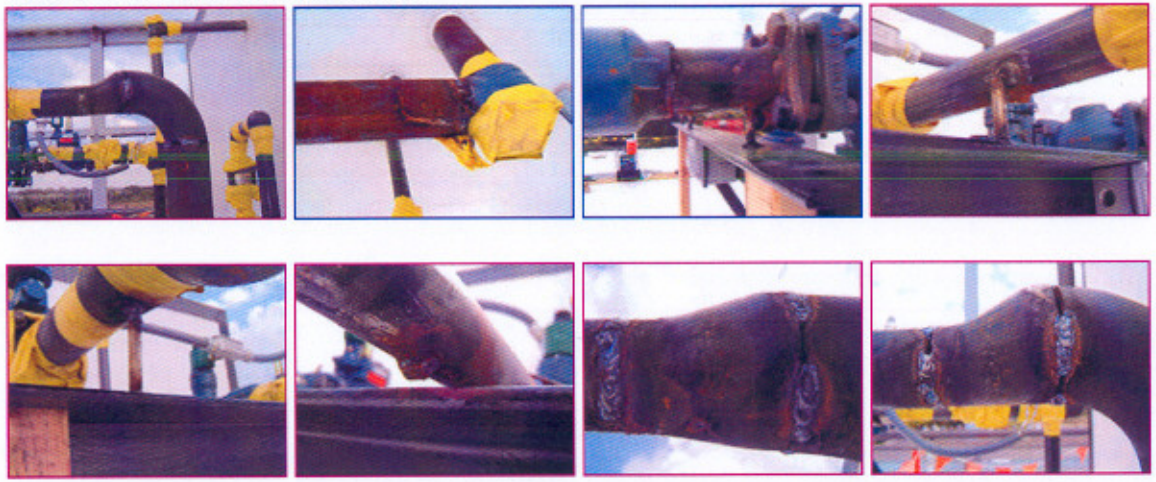
Photos of improper high-pressure-piping welds

The photos below were taken at a project in Minnesota and are of piping sent with five rooftop ammonia refrigeration units. The manufacturer/contractor is from outside of Minnesota and is not licensed to fabricate or install high-pressure piping in the state. The manufacturer/contractor was told not to send any piping, but cut the pieces and "tack welded" them in place. The welds do not even approach code compliance and arc burns are clearly noticeable on the piping.

The manufacturer/contractor also appears to have attempted to weld steel rod to the bottom of the pipe and fittings as a means of support, which is not allowed by code. Many of these welds broke before even reaching the Minnesota project site. The licensed contractor on the site will cut out and replace all of the piping shipped with the units, nearly 300 weld joints.

Click on the image for a larger view



Attachment C